

IN THE CLAIMS:

1. (Currently Amended) Radioactive radiation source for brachytherapy having an elongated radiation emitting element (1) within ~~an elongated means for a~~ containment assembly (2) such that the longitudinal axis of the radiation emitting element and the longitudinal axis of said ~~means for~~ containment assembly are aligned, said ~~means for~~ containment assembly comprising a shielding section (3) and a radiation transition section (4),

said shielding section (3) covering said radiation emitting element at least partially to substantially attenuate any radiation emitted in the direction of said shielding section,

said radiation transition section (4) extending substantially along the longitudinal axis of the ~~means for~~ containment assembly and comprising a shielding material (5),

which shielding material (5) is so adapted as to attenuate the radiation emitted from said radiation emitting element such that, in a plane at a pre-selected distance from the radiation source, a substantially uniform radiation dose is received over a target area (6) having a length substantially larger than the longitudinal axis of the elongated ~~means for~~ containment assembly, and ~~preferably also~~ a diameter substantially larger than the diameter of the ~~means for~~ containment assembly.

2. (Currently Amended) Radiation source according to claim 1, wherein said shielding section (3) and said radiation transition section (4) form integral parts of the ~~means for~~ containment assembly.

3. (Currently Amended) Radiation source according to claim 1, wherein said ~~means for~~ containment assembly (2) comprises a first layer ~~or capsule (2a)~~, which layer or capsule sealingly encloses the radiation emitting element (1), and further comprises a shielding section (3) and a radiation transition (4) which are provided separately from said first layer ~~or capsule (2a)~~ on the outside or inside thereof.

4. (Currently Amended) Radiation source according to claim 1, wherein said shielding material (5) is adapted by varying its thickness, density and/or composition.
5. (Currently Amended) Radiation source of claim 4, wherein the shielding material (5) is provided in a greater thickness in such portions of the radiation transition section (4) closer to the target area (6).
6. (Currently Amended) Radiation source of claim 5, wherein the shielding section (3) covers the radiation emitting element (1) over the full length of its longitudinal axis on at least one side of the element.
7. (Currently Amended) Radiation source of claim 6, wherein the radiation transition section (4) is located on the side of the radiation emitting element opposite to the shielding section (3).
8. (Currently Amended) Radiation source of claim 5 ~~or claim 6~~, wherein the shielding material (5) is provided with a greater shielding capacity, by having ~~preferably in~~ a greater thickness, centrally over and along the longitudinal axis of the radiation emitting element on the part of the source intended directly to oppose the target area.
9. (Currently Amended) Radiation source according to claim 8, wherein said shielding material (5) comprises recesses (7), ~~in particular recessed windows~~, on such portions of the radiation transition section (4) further from the target area (6).

10. (Currently Amended) Radiation source according to ~~one of claims~~ claim 1 to 3, wherein said shielding material (~~5~~) is adapted by varying its shielding effect through varying its density and/or composition.

11. (Currently Amended) Radiation source of claim 10, wherein a material with a higher shielding effect is used in such portions of the radiation transition section (~~4~~) closer to the target area (~~6~~), while in such portions of the radiation transition section (~~4~~) further from the target area (~~6~~) a material with a lower shielding effect is used.

12. (Currently Amended) Radiation source according to ~~one of the claims~~ claim 1 to 11, wherein said radiation source further comprises a cover sleeve enclosing the ~~means for~~ containment assembly.

13. (Currently Amended) Radiation source according to ~~one of the claims~~ claim 1 to 12, wherein the radiation emitting element is provided in tubular or cylindrical form or is comprised of one or more ~~than one~~ spherical elements.

14. (Currently Amended) Radiation source according to ~~one of the claims~~ claim 1 to 13, wherein the radiation emitting element is a beta-radiation emitting element which preferably comprises a nuclide having a ~~max.~~ maximum particle energy of ~~β~~ beta radiation of at least 500 keV.

15. (Currently Amended) Radiation source according to ~~one of claims~~ claim 1-13 wherein the radiation emitting element comprises a nuclide selected from the group consisting of Y90, Sr-90/Y-90, Tm-170, P-32, Cl-36, Ce-144/Pr-144, Tb-160, Ta-182, Tl-204, Sn-123, Re-188, Ir-192 and Se-75.

16. (Original) Radiation source according to claim 14, wherein the radiation emitting element comprises Sr-90/Y-90 or Y-90 in a metallic, plastic or ceramic matrix or supported on a carrier.

17. (Currently Amended) Radiation source according to ~~one of the claims~~ claim 1 to 16, wherein the shielding section ~~(3)~~ comprises a metallic material selected from high Z metals, preferably selected from the group consisting of Pt, Pd, Au, Ag, Ir, Pb, W and their alloys, compounds, and composites and mixtures thereof.

18. (Currently Amended) Radiation source according to ~~one of the claims~~ claim 1 to 17, wherein the ~~means for~~ containment assembly (2,2a) comprises a metallic or plastic material, preferably selected from the group consisting of Al, Ag, Au, Pb, Cd, Ce, Cr, Co, Cu, Fe, Hg, Hf, Bi, In, Mg, Mn, Mo, Nb, Ni, Pd, Pt, Pr, Re, Rh, Sn, Si, Ta, Ti, Tb, Th, V, W, Y, Yb, Zn, Zr and their alloys, compounds and composites and mixtures thereof.

19. (Currently Amended) Radiation source of claim 1, wherein the beta-radiation emitting element ~~(1)~~ is a wire comprising an oxide or salt of Sr-90/Y-90 or Y-90 within a metallic matrix; said ~~means for~~ containment assembly (2) comprises a first sealed metallic cylinder ~~(2a)~~ made of stainless steel, Ti or an alloy comprising Ti; a second cylinder made of an PT-Ir-alloy being provided around said first cylinder, the first halfcircle of the second cylinder around the first cylinder forming said shielding section ~~(3)~~; and the second halfcircle of the second cylinder around the first cylinder forming the radiation transition section ~~(4)~~ by varying the wall thickness of the second cylinder in the second halfcircle, and wherein a cover sleeve is provided in form of a third sealed cylinder made of stainless steel, Ti or a Ti-alloy enclosing the other components of the source.

20. (Currently Amended) Radiation source of claim 1, wherein the beta-radiation emitting element ~~(1)~~ comprises an oxide or salt of Sr-90/Y-90 or Y-90 in a metallic matrix² sealed within a ~~means for~~ containment assembly provided in form of a first sealed cylinder made of stainless steel, Ti or a Ti-alloy enclosing the radiation emitting element; ~~said the the~~ said source further comprising a second cylinder made of an Pt/Ir-alloy provided around said first cylinder, the first halfcircle of the second cylinder around the first cylinder forming said shielding section ~~(3)~~, and the second halfcircle of the second cylinder around the first cylinder forming the radiation transition section ~~(4)~~, the shielding material ~~(5)~~ being provided by varying the wall thickness of the second cylinder in the second halfcircle.

21. (Currently Amended) A method of manufacture of a radiation source according to ~~one of claim 1 to 20~~, including the steps of:

- providing a radioactive radiation source for brachytherapy having an elongated radiation emitting element ~~(1)~~ within an elongated ~~means for~~ containment assembly ~~(2)~~ such that the longitudinal axis of the radiation emitting element and the longitudinal axis of said ~~means for~~ containment assembly are aligned

- providing a shielding section ~~(3)~~ and a radiation transition section ~~(4)~~,
 - said shielding section ~~(3)~~ covering said radiation emitting element at least partially to substantially attenuate any radiation emitting in the direction of said shielding section,

- said radiation transition section ~~(4)~~ extending substantially along the longitudinal axis of the ~~means for~~ containment assembly and comprising a shielding material ~~(5)~~, by adapting the shielding material ~~(5)~~ as to attenuate the radiation emitted from said radiation emitting element such that, in a plate at a preselected distance from the radiation source, a substantially uniform radiation dose is received over a target area ~~(6)~~ having a length substantially larger than the longitudinal axis of the elongated ~~means for~~ containment

assembly, and ~~preferably~~ also a diameter substantially larger than the diameter of the ~~means~~
~~for containment~~ assembly.

22. (Currently Amended) A method of claim 21, wherein the step of adapting the
shielding material ~~(5)~~ is by varying its thickness, density and/or composition.

23. (Currently Amended) A method of claim 21 ~~or 22~~, wherein the shielding material ~~(5)~~
is provided with a greater shielding capacity, ~~preferably in~~ by having a greater thickness,
centrally over and along the longitudinal axis of the radiation emitting element on the part of
the source intended directly to oppose the target area.

24. (Currently Amended) A method of ~~one of claims~~ claim 21 ~~to 23~~, wherein said
shielding material ~~(5)~~ comprises recesses ~~(7)~~, in ~~particular~~ the form of recessed windows, on
such portions of the radiation transition section ~~(4)~~ further from the target area ~~(6)~~.